UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

June 6, 2014

4WD-FFB

Rachel Blumenfeld
United States Department of Energy
Portsmouth/Paducah Project Site Office
P.O. Box 1410
Paducah, Kentucky 42002

Dear Ms. Blumenfeld,

The purpose of this letter is to reply to DOE's April 1, 2014 email and April 10, 2014 letter, wherein DOE proposed a risk-based effluent limit and/or ambient water concentration for Technetium-99 (Tc-99) in Little Bayou Creek as a result of discharges from the Northeast (NE) Plume treatment units associated with CERCLA Interim Remedial Action project. DOE provided the risk evaluation/methodology that was used as the basis to establish the DOE proposed risk-based 1E-6 level of 5,180 pCi/L for Tc-99. As part of the calculation DOE assumed a recreator teen (swimmer) scenario based upon the PGDP Risk Methods Document, which is not EPA guidance. Under the PGDP Federal Facility Agreement Section III. *Purposes of Agreement*, implementation and monitoring of response actions should be performed in accordance with CERCLA, NCP and appropriate EPA guidance and policy.

EPA cannot accept DOE's proposed risk-based effluent limit/ambient water concentration for several reasons:

(1) The DOE recreator teen risk-based calculation is not consistent with EPA methodology for calculating ambient water quality criteria (AWQC) for chemicals. For example, DOE did not assume fish consumption in the calculation. All waters of Kentucky are designated for fish consumption, regardless of whether fish (suitable for consumption) are currently present in the reach of the surface water near the discharge. Therefore, any calculation of an AWQC equivalent for Tc-99 should include risk associated with ingestion of fish.

(2) Little Bayou Creek (LBC) is an impaired stream under CWA §303(d) listed for beta particles, photon emitters, copper and lead. The impaired Use is Warm Water Aquatic Habitat. Impaired waters should not receive additional contaminant/pollutant load above concentrations that would prevent the water from being delisted and attaining its use designation(s). Therefore, the concentrations of Tc-99 (beta emitter) discharged as result of this CERCLA action, as well as other discharges of Tc-99 at the PGDP into LBC, should be limited.

(3) Although LBC is not specifically designated for use as a Domestic Water Supply (DWS), all waters in Kentucky are eligible and will be designated as a DWS if a drinking water intake exists on the stream. Kentucky AWQC for total gross beta particle activity is 50 pCi/L (401 KAR 10:031 Section 6(2)(c)). Concentrations of beta emitters discharged above 50 pCi/L could impair future designated use as a DWS.

(4) EPA Headquarters Office of Water (OW) calculated an ambient water quality level for Tc-99 of 30 pCi/L based on updated human health AWQC assumptions used by the Agency (see attachment). This concentration is at least two orders of magnitude lower than DOE's proposed discharge level/ambient water concentration, and is well below 900 pCi/L (the Safe Drinking Water Act maximum contaminant level or MCL).

(5) The TCE effluent limit of 30 ppb (identified as a result of an ARAR) for the NE Plume Project is the TCE AWQC (401 KAR 10:031 Section 6(1)). The Kentucky concentration was adopted from EPA's Human Health Ambient Water Quality Criteria for consumption of Organism Only. The FFA parties agreed that use of the AWQC as an effluent limit would be protective of the receiving water. In the event parties decide to calculate a Tc-99 AWQC equivalent, then the same approach for using the TCE AWQC as an effluent limit should be applied to establishment of a Tc-99 effluent limit.

Please note that if a site-specific AWQC equivalent or effluent limit as a cleanup level were to be established for Tc-99 consistent with CERCLA and the NCP, it would have to be protective of human health and the environment, and it would be calculated consistent with EPA guidance, including appropriate methodologies used by the Agency.

For the reasons stated above, EPA cannot agree to DOE's proposed risk-based effluent level/ambient concentration for Tc-99. Therefore, EPA maintains that its original proposal in resolving this dispute of adding ion exchange (best available control technology) to the NE Plume treatment units when groundwater at or above 900 pCi/L Tc-99 enters the newly relocated extraction wells zone of influence is the best approach for this project. This approach is consistent with the Northwest Plume CERCLA project, avoids possibly protracted debate on an appropriate ambient water level for Tc-99, and will be protective of human health and the environment. Moreover, the addition of the ion exchange treatment is contingent upon the groundwater levels of Tc-99 being reached in the extraction wells zone of influence which according to DOE is estimated to be a couple of years. Thus, the project can continue un-impeded and continue extracting and treating the NE plume.

If you have any questions or require additional information, please contact me at (404) 562-8513.

Sincerely,

Jennifer Tufts

Digitally signed by Jennifer Tufts
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Date: 2014.06.06 10:38:09 -04'00'

Jennifer Tufts
Remedial Project Manager
Federal Facilities Branch

Attachment

EPA Office of Water Technetium-99 AWQC Equation and Assumptions

Equation for Fish Ingestion
$$\text{Target Risk}_{fish} = (C_{water} * BCF) * FI * F_{cf} * EF * ED * SF_{fish\ ingestion}$$ Or $$C_{water} = \frac{\text{Target Risk}_{fish}}{BCF * FI * F_{cf} * EF_{fish} * ED_{fish} * SF_{fish\ ingestion}}$$
$\text{Target Risk}_{fish}$= screening level risk estimate for fish ingestion   **C_{water} = concentration of radionuclide in surface water (pCi/L)**   **BCF= bioconcentration factor (L/kg)**   **FI = average daily consumption of fish (kg/day)**   **F_{cf}= fraction of fish consumed that is contaminated (unitless)**   **EF_{fish} = exposure frequency (days/year)**   **ED_{fish} = exposure duration (years)**   **$SF_{fish\ ingestion}$= oral slope factors for food ingestion (risk/pCi)=values reported in Federal Guidance Report 13 (http://www.epa.gov/rpdweb00/federal/techdocs.html)**

Organism Only Criteria Assumptions for Tc-99:

Target Risk	1E-6
Fish Intake[1]	17.5 g/d
BCF ANL.1993.NCRP[2]	2.00E+01 L/kg
EF fish[1]	365 d/year
ED fish[1]	70 year
SF fish (FG13)[3]	4.00E-12 risk/pCi

1. Target Risk, Fish Intake, EF and ED, please reference OW's 2000 Human Health Methodology: *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000);* EPA-822-B-00-004.

2. National Council on Radiation Protection and Measurements, NCRP Report No. 116, 1993.

3. *Report No. 13: Cancer Risk coefficients for Environmental Exposure to Radionuclides;* EPA-402-R-99-001